SWOT Science Team Meeting

Program Status

Bordeaux, June 18, 2019

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SWOT Program Manager
CNES – Science, Applications and Innovation Directorate

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Physical Oceanography Program Manager
SWOT Program Scientist
NASA Headquarters

Program Status

A NASA/ CNES JSG was held on April 18th 2019, to review the project status and review the results from the data products shorter latencies study and decide the implementation of the proposed approach.

- The JSG noted the considerable overall progress in flight and ground segment development since July 18th JSG meeting. The Payload flight hardware development is nearing completion with subsystems already delivered or close to be delivered to KaRIn Integration and Test (I&T).
- Launch vehicle development, ground system maturation, and algorithm and cal/val development have progressed satisfactorily in support of the 2021 launch.
- **The data products study recommended pursuing the goal for shortening the latency from 45 days to <3 days and it recommended introducing additional opportunities to generate reprocessed science data products for greater science return. It will require a change in the baseline plan for the science data processing workshare between NASA and CNES.**
- A SDS Key point reviewed the detailed implementation of the study. Its review board endorsed the approach with no significant issues or identified threats.
- The JSG co-chairs (Sandra Cauffman from NASA and Marie-Anne Clair from CNES) supported the proposed implementation, noting that it would result in an improvement of the Scientific return.

SWOT Science Team - ROSES and TOSCA Strategy agreed

- **Current SWOT Science Team funded until Spring 2020 (US) and end 2019 (Fr)**
- **A call for SWOT Science Team has been issued (June 14th) for TOSCA proposals**
  - key pre-launch preparations, post-launch calibration and validation, and initial scientific exploitation
  - French, European and international proposals
  - **Due Date End of October**
- **New call for SWOT Science Team call to be issued as an amendment to ROSES 2019 circa July-August 2019.**
  - Due date for proposals TBD (Nov 2019?)
- **Task duration Apr-2020 to Apr 2024 (4 years)**
- **Review and selection by end of March 2020**
- **US Funding level for selection comparable to present team ($3M/yr for both oceanography and hydrology)**
- **Fr Finding level (CNES : 1M€/yr, 20 FTE for Ocean and Hydrology (2,7M€), Thesis and Post-Doc)**
- **Scope of work not dissimilar to present team**

SWOT Science Team ROSES and TOSCA Strategy (2)

Next opportunity to add to Science Team (post-launch science expansion) in likely ROSES and TOSCA 2022. Precise timing dependent on launch date and availability of funds.

In other words, we do not plan to wait until ROSES 2023 to expand the team for post-launch science exploitation.

Joint ROSES-TOSCA coordination

ROSES-TOSCA coordination will proceed similar to prior SWOT Science Team.

ROSES receives USA proposals; where international collaborations are encouraged.

CNES/TOSCA receives European and international scientific proposals.

Teams are encouraged to pursue active coordination and collaboration with other international Teams where possible and deemed useful.

SWOT Cal/Val – US Strategy

Now decided to support the entire SWOT cal/val enterprise through the SWOT Project at JPL.

NO ROSES call for SWOT Cal/Val field campaign or cal/val data analysis. SWOT Project will contract the the field work and cal/val science advice (sufficient to meet mission requirements).

SWOT Science Team members 2020-2024 may be engaged in cal/val as part of their projects

News in CNES organisation

Annick Sylvestre-Baron Ocean Program manager : Annick.Sylvestre-Baron@cnes.fr

Philippe Maisongrande, Hydrology Program manager : Philippe.Maisongrande@cnes.fr

Anne Lifermann, Coastal Program manager : Anne.Lifermann@cnes.fr

We would like to thank Vincent Albouys who is moving for an another position :Project Manager

CFOSAT mission

- **Launch date: 2018, October 29th**
- **Commissioning phase on-going until June**
- **Opening of data: fall 2019**

CFOSAT: A China/France world premiere for oceanography

Joint measurements of oceanic wind and waves

- **SWIM**: a wave scatterometer (new instrument)
- **SCAT**: a wind scatterometer (fan beam concept)

Main Objective : Measure at the global scale ocean surface wind and waves spectral properties

Applications :

- atmospheric, oceanic and wave forecast systems
- wind and wave climatology
- characterization of processes affecting surface waves
- characterization and modeling of ocean/atmosphere coupling

Secondary objective : Land and sea ice characterization (Sun synchronous polar orbit)

- Sea ice and ice cover
- Land surface (variations of humidity and roughness)

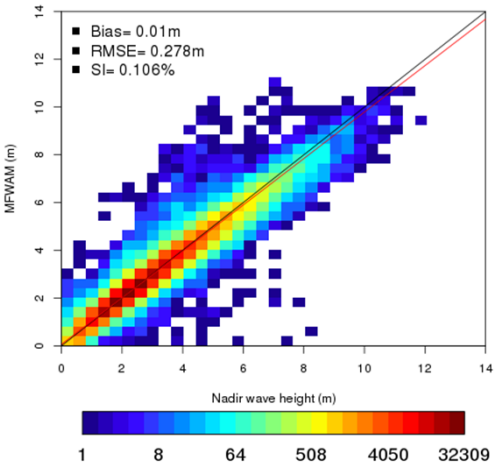
SWIM: some results

Estimations from nadir beam (with ADAPTIVE retracking)

- Very good constancy with models (ECMWF, MFWAM) and conventional altimeters

SWIM Wave Products

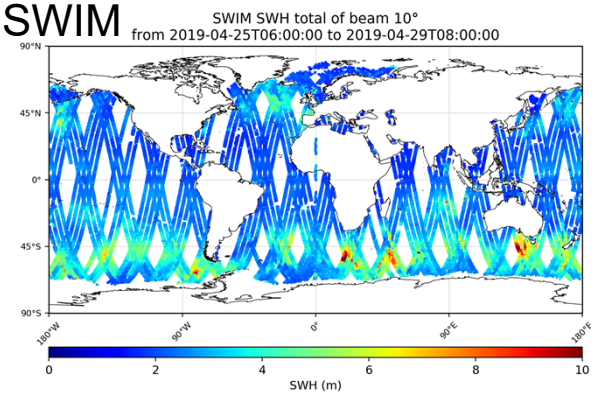
- Main parameters globally consistent with model

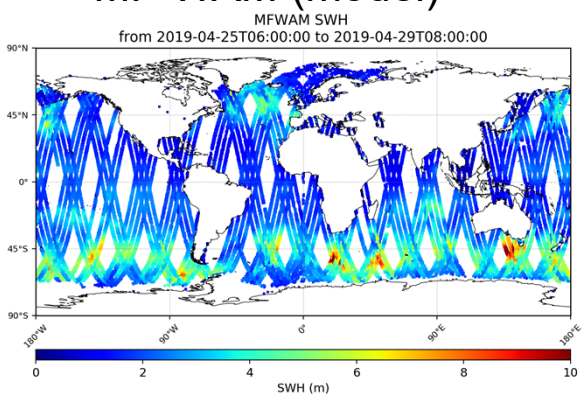


SWIM

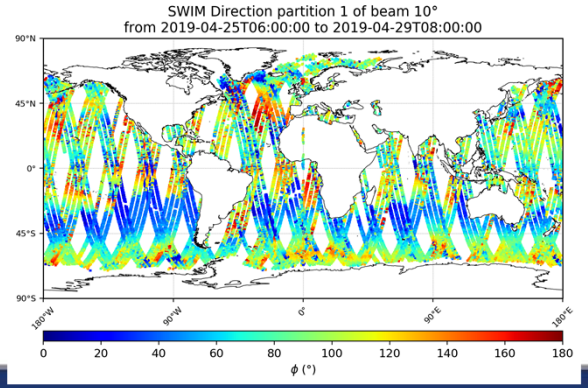
MF-WAM (model)

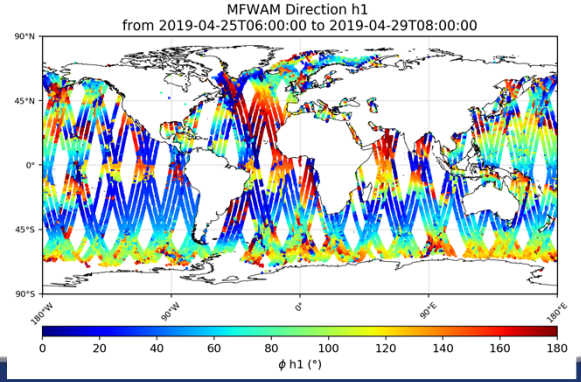
wave height





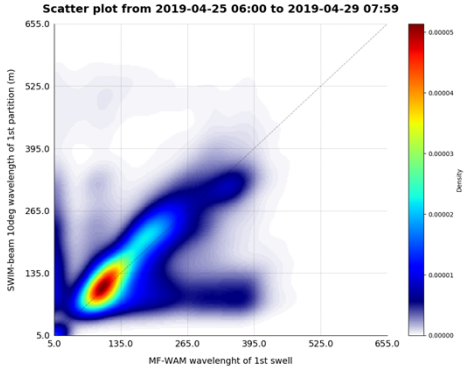
dominant directions





dominant wavelengths

SWIM



MF-WAM (model)

Coming soon

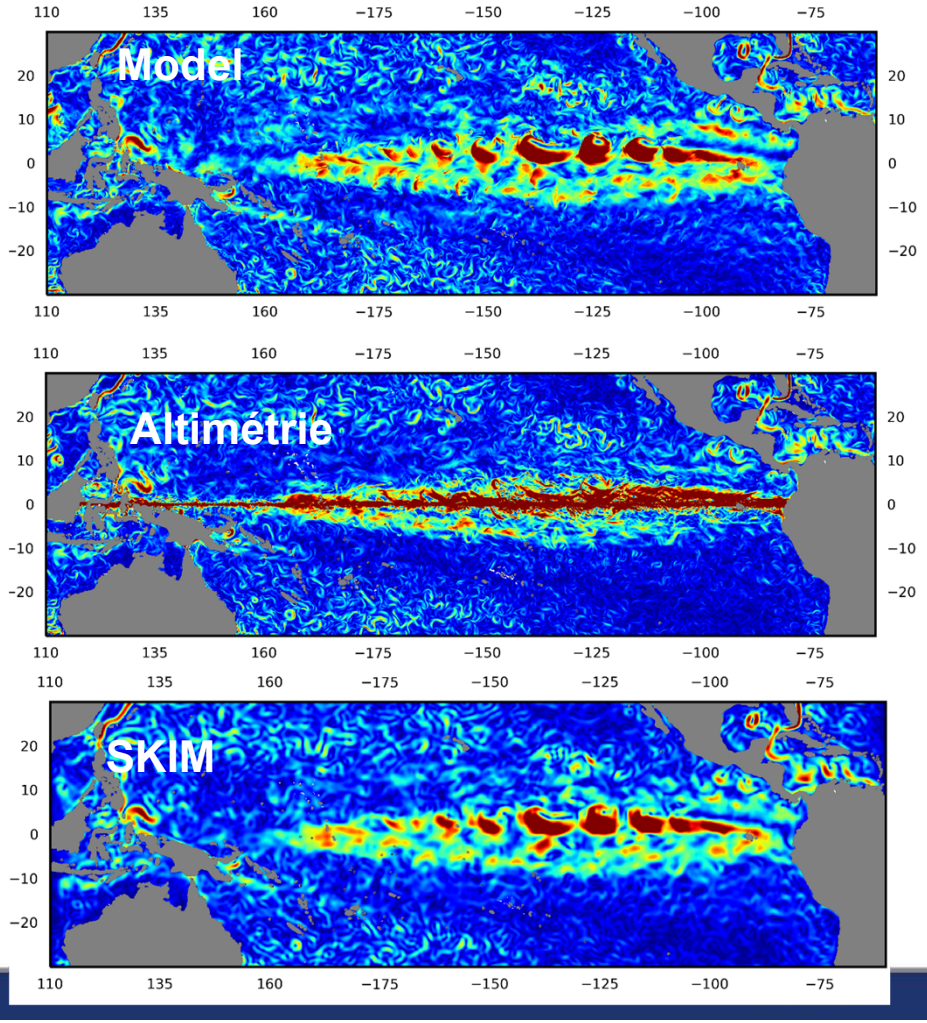
Data availability:

- Open to the science team: June
- Opened worldwide access: fall 2019

All is on AVISO+ website

SKIM: Surface Kinematics Monitoring

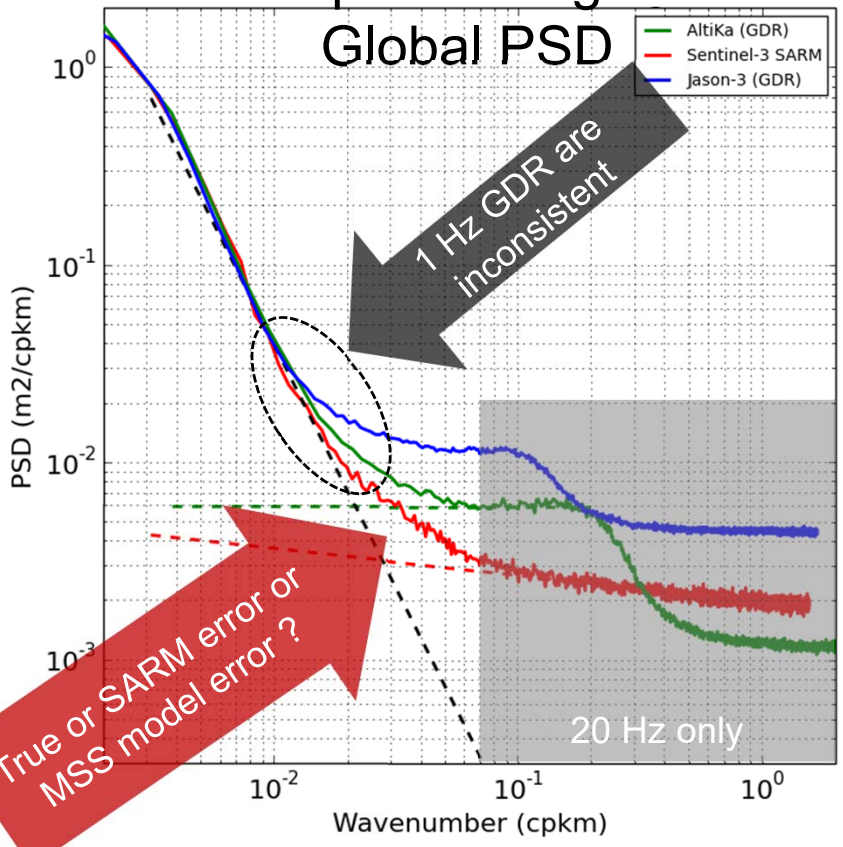
- Candidate mission for Earth Explorer 9
- Understanding surface motion
- Strong heritage from SWIM (~SWIM with Doppler capacity and SAR altimeter)



Ongoing validation: R&D DUACS 2018 (better LRM)

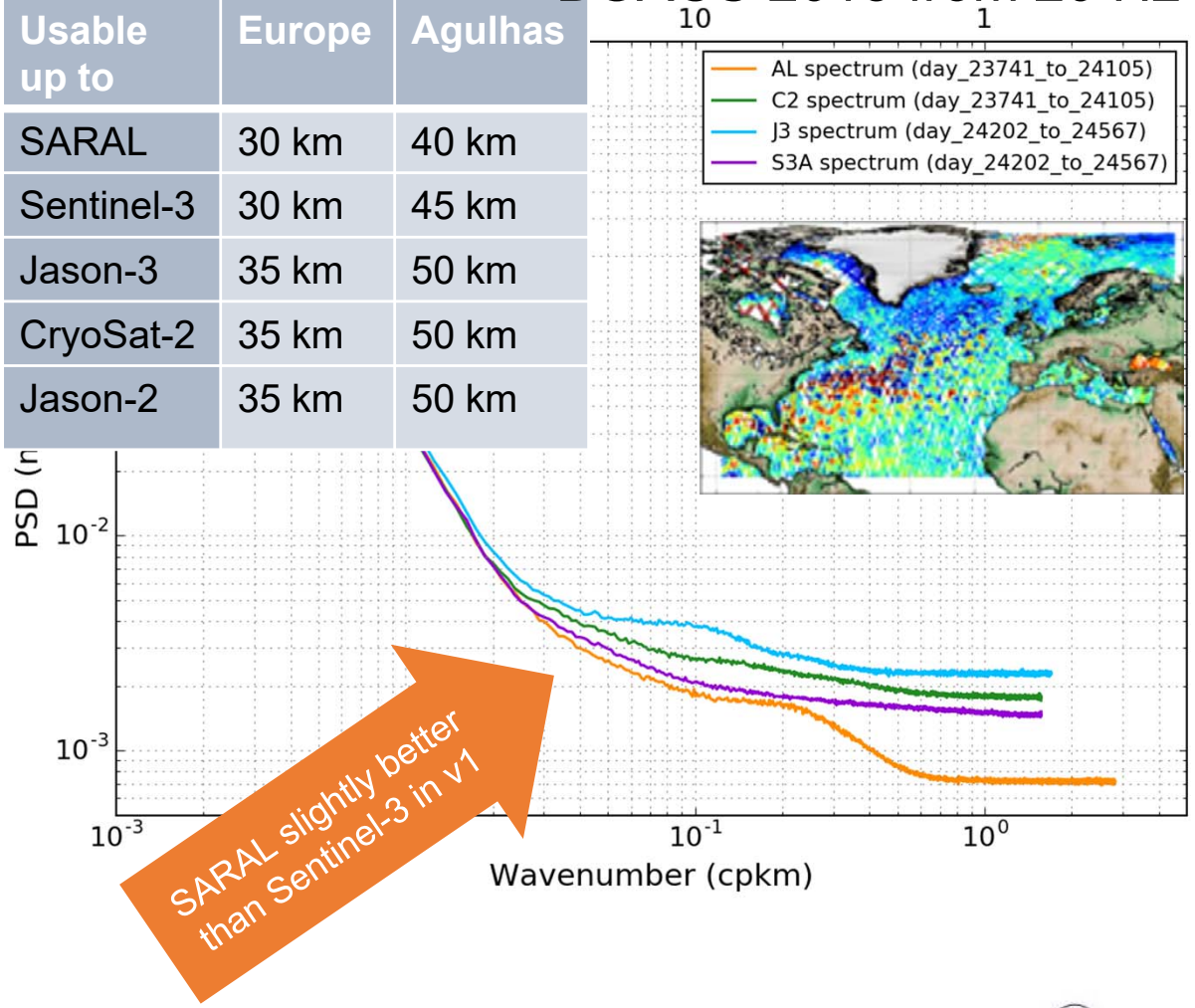
2016 with classical 1 Hz processing

Global PSD



Usable up to	Europe	Agulhas
SARAL	30 km	40 km
Sentinel-3	30 km	45 km
Jason-3	35 km	50 km
CryoSat-2	35 km	50 km
Jason-2	35 km	50 km

DUACS 2018 from 20 Hz



Level-2P: OLTC upgrades

- More than 30.000 new inland targets integrated in S3B in Nov 2018. Upload performed also on S3A in March 2019
- Should be compared to current global altimetry databases with ~2000 targets
- OLTC table efficiency and performance quantified with Jason-3
- Latitude range (<60°) limited by input DEM availability : upgrades ongoing in high-latitudes proof-of-concept studies
- Increases ability to build Level-4 hydrology products
- Could support SWOT validation in orbit